

Appl. No.: 10/804,814
Amtd. Dated: 07/06/2006
Off. Act. Dated: 03/07/2006

REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested in view of the foregoing amendments and discussion presented herein.

1. **Rejection of Claims under 35 U.S.C. §103.**

Claims 1-26 were rejected under 35 U.S.C. §103(a) as being unpatentable over Frank (844) in view of WO 01/20198 A1 (Van Doorne). In support of the rejection, the Examiner states:

"Frank discloses a hybrid electric vehicle having a continuously variable transmission (18), an internal combustion engine (10) coupled to the CVT, an electric motor (24) coupled to an output of the engine, a system controller (30) controlling the motor, engine and rate of change of ratio of the CVT varying an acceleration (via 32) and deceleration (via 34) by varying motor torque (42) and rate of change of ratio (44), but does not disclose mapping a rate of change of ratio to clamping pressure and the remaining limitations used for this in claims 1-13.

WO discloses a control system for a continuously variable transmission having a programmable controller (17-19) and means associated with the controller for mapping rate of change of ratio to clamping pressure between the pulleys of the CVT (claims 3-5, Figure 4 (algorithm or map)), a hydraulic servo control system (15, 16, 20, 21) controlled by the controller and controlling clamping pressure of the CVT, achieving a desired rate of change ratio of the CVT (ROC), achieving a commanded clamping pressure (Pf, Ps) in response to an input torque (Tp) and a commanded ratio rate (RC) based on a mapping of empirical data pertaining to pressure (cylinder pressure), ratio rate (pulley ratio) and torque (transmission torque), controlling the ratio rate and clamping pressure based on a ratio map (mapping of ratio rate above), and transmitting a given amount of torque (Tt) according to the map (Figure 4).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide Frank with a mapping rate of change ratio to clamping pressure in view of WO to prevent slipping of the drive belt.

After carefully reviewing the grounds for rejection and the references cited by the Examiner, the Applicant has amended each of independent Claims and several dependent claims to recite aspects of the Applicant's invention that are not taught by

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the cited references.

2. Regarding Claims 1-13.

(a) Claim 1 has been amended to recite the primary and secondary hydraulic pulleys in the preamble and to recite a primary pump connected to the primary pulley and a secondary pump coupled to the secondary pulley where the two pumps are not hydraulically connected. Support for this amendment is found in paragraph [00268] and FIG 29. Frank does not disclose the hydraulic configuration of the CVT. WO discloses a single pump with hydraulic valves. There is no suggestion, teaching or motivation to use separate pumps and hydraulic systems in Frank or WO.

(b) Dependent Claims 2 and 4 have been amended to add the limitation of a torque clipping algorithm to throttle back the torque to the primary pulley when the clamping pressure is insufficient to prevent slipping of the drive belt. Support for this feature is found in paragraph [0270] of Applicant's specification. There is no suggestion, teaching or motivation disclosed in Frank or WO to use a torque clipping algorithm to limit the clamping pressure of the primary pulley.

(c) Claim 3 has been amended to recite the primary and secondary hydraulic pulleys in the preamble and to recite a pressure pump connected to the secondary pulley where the pressure pump has a bypass control valve that opens below a predetermined pressure. Support for this amendment is found in paragraph [0087] and FIG. 8 where the valve is used to make the control system more stable at low pressures. There is no suggestion, teaching or motivation in Frank or WO for a bypass valve that opens at low pressures.

(d) Claim 5 has been amended to recite the primary and secondary hydraulic pulleys in the preamble and to recite a pressure pump and a shift pump where the pressure on the secondary pulley is raised instead of lowering the pressure on the primary pulley when the CVT is shifted toward low gear. Support for this amendment is found in paragraph [00263]. Frank does not disclose the hydraulic configuration of the CVT. In WO,

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"The electro-hydraulic control system 15, 16, 17, 18, 20 21 shown in FIG. 2 is generally known as the Master/Slave hydraulic layout, since at any given time the cylinder pressure Ps in the piston/cylinder assembly 13 of the second or slave pulley 5 is bound by the level of the cylinder pressure Pf in the piston/cylinder assembly 12 of the first or Master pulley 4." (col. 6 line 62, col. 7 line 1)

WO does not teach or suggest a shift pump or raising the pressure on the secondary pulley which is bound by the pressure on the primary pulley.

(e) Claim 6 which depends from Claim 5 has been amended to recite a bypass control valve connected to the pressure pump that opens below a predetermined pressure. Support for this amendment is found in paragraph [0087] and FIG. 8 where the valve is used to make the control system more stable at low pressures. There is no suggestion, teaching or motivation in Frank or WO for a bypass valve that opens at low pressures.

(f) Claim 7 has been amended to recite the primary and secondary hydraulic pulleys in the preamble and to recite a primary pump connected to the primary pulley and a secondary pump coupled to the secondary pulley where the two pumps are not hydraulically connected. Support for this amendment is found in paragraph [00268] and FIG 29. Frank does not disclose the hydraulic configuration of the CVT. WO discloses a single pump with hydraulic valves. Claim 7 also recites where the pressure on the secondary pulley is raised instead of lowering the pressure on the primary pulley when the CVT is shifted toward low gear. Support for this limitation is discussed in 2(d) above. There is no suggestion, teaching or motivation to use separate pumps or raise the pressure in the secondary pulley when the CVT is shifted to low gear in Frank or WO.

(g) Claims 9 and 11 have been amended to add the limitation of a torque clipping algorithm to throttle back the torque to the primary pulley when the clamping pressure is insufficient to prevent slippage in the CVT. Support for this limitation is found in paragraph [0270] of Applicant's specification. There is no suggestion, teaching

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or motivation disclosed in Frank or WO to use a torque clipping algorithm to limit the clamping pressure of the primary pulley.

(h) Claim 13 has been amended to recite the primary and secondary hydraulic pulleys in the preamble and to recite where the pressure on the secondary pulley is raised instead of lowering the pressure on the primary pulley when the CVT is shifted toward low gear. Support for this amendment is found in paragraph [00263] and discussed in 2(d) above. Claim 13 has also been amended to recite a torque clipping algorithm as discussed in 2(g) above.

(i). The combination of features and controls recited in the Applicant's claims as amended above has not been taught and is not rendered obvious by the cited references. Accordingly, the rejection under 35 U.S.C. §103 should be withdrawn.

3. Regarding Claims 14-26.

(a) Claim 14 has been amended to recite primary and secondary hydraulic pulleys in the CVT and to recite a primary pump connected to the primary pulley and a secondary pump coupled to the secondary pulley where the two pumps are not hydraulically connected. Support for this amendment is found in paragraph [00268] and FIG 29. Frank does not disclose the hydraulic configuration of the CVT. WO discloses a single pump with hydraulic valves. There is no suggestion, teaching or motivation to use separate pumps and hydraulic systems in Frank or WO.

(b) Dependent Claims 15 and 17 have been amended to add the limitation of a torque clipping algorithm to throttle back the torque to the primary pulley when the clamping pressure is insufficient to prevent slipping of the drive belt. Support for this feature is found in paragraph [0270] of Applicant's specification. There is no suggestion, teaching or motivation disclosed in Frank or WO to use a torque clipping algorithm to limit the clamping pressure of the primary pulley.

(c) Claim 16 has been amended to recite primary and secondary hydraulic pulleys in the CVT and to recite a pressure pump connected to the secondary pulley where the pressure pump has a bypass control valve that opens below a predetermined

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pressure. Support for this amendment is found in paragraph [0087] and FIG. 8 where the valve is used to make the control system more stable at low pressures. There is no suggestion, teaching or motivation in Frank or WO for a bypass valve that opens at low pressures.

(d) Claim 18 has been amended to recite primary and secondary hydraulic pulleys in the CVT and to recite a pressure pump and a shift pump where the pressure on the secondary pulley is raised instead of lowering the pressure on the primary pulley when the CVT is shifted toward low gear. Support for this amendment is found in paragraph [00263]. Frank does not disclose the hydraulic configuration of the CVT. In WO,

“The electro-hydraulic control system 15, 16, 17, 18, 20 21 shown in FIG. 2 is generally known as the Master/Slave hydraulic layout, since at any given time the cylinder pressure Ps in the piston/cylinder assembly 13 of the second or slave pulley 5 is bound by the level of the cylinder pressure Pf in the piston/cylinder assembly 12 of the first or Master pulley 4.” (col. 6 line 62, col. 7 line 1)

WO does not teach or suggest a shift pump or raising the pressure on the secondary pulley which is bound by the pressure on the primary pulley.

(e) Claim 19 which depends from Claim 18 has been amended to recite a bypass control valve connected to the pressure pump that opens below a predetermined pressure. Support for this amendment is found in paragraph [0087] and FIG. 8 where the valve is used to make the control system more stable at low pressures. There is no suggestion, teaching or motivation in Frank or WO for a bypass valve that opens at low pressures.

(f) Claim 20 has been amended to recite primary and secondary hydraulic pulleys in the CVT and to recite a primary pump connected to the primary pulley and a secondary pump coupled to the secondary pulley where the two pumps are not fluidly connected. Support for this amendment is found in paragraph [00268] and FIG 29. Frank does not disclose the hydraulic configuration of the CVT. WO discloses a single

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pump with hydraulic valves. Claim 20 also recites where the pressure on the secondary pulley is raised instead of lowering the pressure on the primary pulley when the CVT is shifted toward low gear. Support for this limitation is discussed in 3(d) above. There is no suggestion, teaching or motivation to use separate pumps or raise the pressure in the secondary pulley when the CVT is shifted to low gear in Frank or WO.

(g) Claims 22 and 24 have been amended to add the limitation of a torque clipping algorithm to throttle back the torque to the primary pulley when the clamping pressure is insufficient to prevent slippage in the CVT. Support for this feature is found in paragraph [0270] of Applicant's specification. There is no suggestion, teaching or motivation disclosed in Frank or WO to use a torque clipping algorithm to limit the clamping pressure of the primary pulley.

(h) Claim 26 has been amended to recite primary and secondary hydraulic pulleys in the CVT and to recite where the pressure on the secondary pulley is raised instead of lowering the pressure on the primary pulley when the CVT is shifted toward low gear. Support for this amendment is found in paragraph [00263] and discussed in 3(d) above. Claim 26 has also been amended to recite a torque clipping algorithm as discussed in 3(g) above.

(i) The combination of features and controls recited in the Applicant's claims as amended above has not been taught and is not rendered obvious by the cited references. Accordingly, the rejection under 35 U.S.C. §103 should be withdrawn.

4. Amendments Made Without Prejudice or Estoppel.

Notwithstanding the amendments made and accompanying traversing remarks provided above, the Applicant has made these amendments in order to expedite allowance of the currently pending subject matter. However, the Applicant does not acquiesce in the original ground for rejection with respect to the original form of these claims. These amendments have been made without any prejudice, waiver, or estoppel, and without forfeiture or dedication to the public, with respect to the original subject matter of the claims as originally filed or in their form immediately preceding

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these amendments. The Applicant reserves the right to pursue the original scope of these claims in the future, such as through continuation practice, for example.

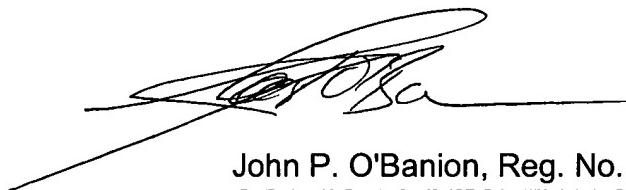
5. Conclusion.

Based on the foregoing, the Applicant respectfully requests that the various grounds for rejection in the Office Action be reconsidered and withdrawn with respect to the presently amended form of the claims, and that a Notice of Allowance be issued for the present application to pass to issuance.

In the event any further matters remain at issue with respect to the present application, the Applicant respectfully requests that the Examiner please contact the undersigned below at the telephone number indicated in order to discuss such matter prior to the next action on the merits of this application.

Date: 7/6/06

Respectfully submitted,



John P. O'Banion, Reg. No. 33,201
O'BANION & RITCHEY LLP
400 Capitol Mall, Suite 1550
Sacramento, CA 95814
(916) 498-1010